Appendix E. Example Output from T-REX and T-HERPS

T-REX (turf use)

TREX MODEL INPUTS

These values will be used in the calculation of exposure estimates for foliar, granular, liquid and/or seed applications of pesticides.

Chemical Identity and Application Information

Chemical Name:	**Methomyl**
Seed Treatment?	☐ FALSE
Use:	**Grasses**
Product name and form:	
% A.I. (leading zero must be entered for formulations <1% a.i.):	**100.00%**
Application Rate (lb ai/acre)	**0.9**
Half-life (days):	**2.5**
Application Interval (days):	**5**
Number of Applications:	**4**
Are you assessing applications with variable rates or intervals?	**no**

Assessed Species Inputs (optional, use defaults for RQs for national level assessments)

What body weight range is assessed (grams)?	Birds	Mammals
Small	20	15
Medium	100	35
Large	1000	1000

Avian

Endpoint	Toxicity value	Indicate test species below
LD50 (mg/kg-bw)	24.20	Bobwhite quail
LC50 (mg/kg-diet)	1100.00	Bobwhite quail
NOAEL (mg/kg-bw)		Bobwhite quail
NOAEC (mg/kg-diet)	150.00	Bobwhite quail

Enter the Mineau et al. Scaling Factor	1.0778

Mammalian

		Acute Study	Chronic Study
Size (g) of mammal used in toxicity study Default rat body weight is 350 grams		**350**	**350**
Endpoint	**Toxicity value**		**Reference (MRID)**
LD50 (mg/kg-bw)	**30.00**		
LC50 (mg/kg-diet)			
Reported Chronic Endpoint	**75.00**	mg/kg-diet	
Is estimated daily dose (mg/kg-bw) reported from the available chronic mammal study? (yes or no)	**no**		

Estimated Chronic Daily Dose Equivalent to reported Chronic Dietary Endpoint	**3.75**	**mg/kg-bw based on standard FDA lab rat conversion**

Summary of Risk Quotient Calculations Based on Upper Bound Kenaga EECs

Table X. Upper Bound Kenaga, Acute Avian Dose-Based Risk Quotients													
Size Class (grams)	Adjusted LD50	EECs and RQs											
		Short Grass		Tall Grass		Broadleaf Plants		Fruits/Pods/Seeds		Arthropods		Granivore	
		EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
20	20.42	326.72	16.00	149.75	7.34	183.78	9.00	20.42	1.00	127.97	6.27	4.54	0.22
100	23.14	186.31	8.05	85.39	3.69	104.80	4.53	11.64	0.50	72.97	3.15	2.59	0.11
1000	27.68	83.41	3.01	38.23	1.38	46.92	1.70	5.21	0.19	32.67	1.18	1.16	0.04

Table X. Upper Bound Kenaga, Subacute Avian Dietary Based Risk Quotients										
	EECs and RQs									
	Short Grass		Tall Grass		Broadleaf Plants		Fruits/Pods/Seeds		Arthropods	
LC50	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
1100	286.88	0.26	131.48	0.12	161.37	0.15	17.93	0.02	112.36	0.10

Size class not used for dietary risk quotients

Table X. Upper Bound Kenaga, Chronic Avian Dietary Based Risk Quotients										
	EECs and RQs									
	Short Grass		Tall Grass		Broadleaf Plants		Fruits/Pods/Seeds		Arthropods	
NOAEC (ppm)	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
150	286.88	1.91	131.48	0.88	161.37	1.08	17.93	0.12	112.36	0.75

Size class not used for dietary risk quotients

Table X. Upper Bound Kenaga, Acute Mammalian Dose-Based Risk Quotients													
Size Class (grams)	Adjusted LD50	EECs and RQs											
		Short Grass		Tall Grass		Broadleaf Plants		Fruits/Pods/Seeds		Arthropods		Granivore	
		EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
15	65.93	273.51	4.15	125.36	1.90	153.85	2.33	17.09	0.26	107.126	1.6247	3.7988	0.0576
35	53.35	189.03	3.54	86.64	1.62	106.33	1.99	11.81	0.22	74.0384	1.3878	2.6255	0.0492
1000	23.07	43.83	1.90	20.09	0.87	24.65	1.07	2.74	0.12	17.1661	0.7439	0.6087	0.0264

Table X. Upper Bound Kenaga, Acute Mammalian Dietary Based Risk Quotients										
	EECs and RQs									
	Short Grass		Tall Grass		Broadleaf Plants		Fruits/Pods/Seeds		Arthropods	
LC50 (ppm)	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
0	286.88	#DIV/0!	131.48	#DIV/0!	161.37	#DIV/0!	17.93	#####	112.36	#DIV/0!

Size class not used for dietary risk quotients

Table X. Upper Bound Kenaga, Chronic Mammalian Dietary Based Risk Quotients										
NOAEC (ppm)	EECs and RQs									
	Short Grass		Tall Grass		Broadleaf Plants		Fruits/Pods/Seeds/Large Insects		Arthropods	
	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
75	286.88	3.83	131.48	1.75	161.37	2.15	17.93	0.24	112.36	1.50

Size class not used for dietary risk quotients

Table X. Upper Bound Kenaga, Chronic Mammalian Dose-Based Risk Quotients													
Size Class (grams)	Adjusted NOAEL	EECs and RQs											
		Short Grass		Tall Grass		Broadleaf Plants		Fruits/Pods/Seeds		Arthropods		Granivore	
		EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
15	8.24	273.51	33.19	125.36	15.21	153.85	18.67	17.09	2.07	107.13	13.00	3.80	0.46
35	6.67	189.03	28.35	86.64	12.99	106.33	15.95	11.81	1.77	74.04	11.10	2.63	0.39
1000	2.88	43.83	15.20	20.09	6.96	24.65	8.55	2.74	0.95	17.17	5.95	0.61	0.21

T-REX (granular use)

TREX MODEL INPUTS

These values will be used in the calculation of exposure estimates for foliar, granular, liquid and/or seed applications of pesticides.

Chemical Identity and Application Information

Chemical Name:	Methomyl
Seed Treatment?	☐ FALSE
Use:	Granular - 5G Granular
Product name and form:	
% A.I. (leading zero must be entered for formulations <1% a.i.):	100.00%
Application Rate (lb ai/acre)	0.15
Half-life (days):	
Application Interval (days):	
Number of Applications:	1
Are you assessing applications with variable rates or intervals?	no

Assessed Species Inputs (optional, use defaults for RQs for national level assessments)

What body weight range is assessed (grams)?	Birds	Mammals
Small	20	15
Medium	100	35
Large	1000	1000

LD50 ft-2

Application Type: Rows/Band/In-furrow / Granular

Enter data below:	
Do not use this input	
Do not use this input	
Do not use this input	
Row spacing (in):	30.00
Bandwidth (in):	8.00
% incorporated	0.00%

Row/Band/In-furrow applications

Granular

Intermediate Calculations

# rows acre-1:	83.48
row length (ft):	208.71
lb ai/1000 ft row:	0.01
bandwidth (ft):	0.67
mg ai/ft2:	5.86
exposed mg ai/ft2:	5.86

LD50 ft-2

	wgt class (grams)	
Avian	20	14.35
	100	2.53
	1000	0.21
Mammal	15	5.92
	35	3.14
	1000	0.25

N/A

Intermediate Calculations

mg a.i./1000 ft row:	N/A
bandwidth:	N/A
mg a.i./ft2:	N/A
exposed mg a.i./ft2:	N/A

N/A

	wgt class (grams)	
Avian	20	N/A
	100	N/A
	1000	N/A
Mammal	15	N/A
	35	N/A
	1000	N/A

LD50 ft-2

Application Type:	Broadcast / Granular	**Make sure to enter an application rate above**
Do not use this input		
Do not use this input		
Do not use this input		
Do not use this input		
Do not use this input		
% incorporated		**0.00%**

.

Broadcast applications **Granular**		
Intermediate Calculations		
mg ai/ft2:	**1.56**	
LD50 ft-2		
	wgt class (grams)	
Avian	**20**	**3.83**
	100	**0.68**
	1000	**0.06**
Mammal	**15**	**1.58**
	35	**0.84**
	1000	**0.07**

T-REX (Scatter bait use)

TREX MODEL INPUTS

These values will be used in the calculation of exposure estimates for foliar, granular, liquid and/or seed applications of pesticides.

Chemical Identity and Application Information

Chemical Name:	Methomyl
Seed Treatment?	☐ FALSE
Use:	Scatter bait - StimuKil (1% a.i.)
Product name and form:	
% A.I. (leading zero must be entered for formulations <1% a.i.):	100.00%
Application Rate (lb ai/acre)	0.2178
Half-life (days):	
Application Interval (days):	
Number of Applications:	1
Are you assessing applications with variable rates or intervals?	no

Assessed Species Inputs (optional, use defaults for RQs for national level assessments)

What body weight range is assessed (grams)?	Birds	Mammals
Small	20	15
Medium	100	35
Large	1000	1000
Avian		
Endpoint	Toxicity value	Indicate test

		species below
LD50 (mg/kg-bw)	24.20	Bobwhite quail
LC50 (mg/kg-diet)	1100.00	Bobwhite quail
NOAEL (mg/kg-bw)		Bobwhite quail
NOAEC (mg/kg-diet)	150.00	Bobwhite quail
Enter the Mineau et al. Scaling Factor	1.0778	

Mammalian

		Acute Study	Chronic Study
Size (g) of mammal used in toxicity study Default rat body weight is 350 grams		350	350
Endpoint	**Toxicity value**		**Reference (MRID)**
LD50 (mg/kg-bw)	14.00		
LC50 (mg/kg-diet)			
Reported Chronic Endpoint	75.00	mg/kg-diet	
Is estimated daily dose (mg/kg-bw) reported from the available chronic mammal study? (yes or no)	no		

Estimated Chronic Daily Dose Equivalent to reported Chronic Dietary Endpoint	3.75	mg/kg-bw based on standard FDA lab rat conversion

LD50 ft-2

Application Type: Broadcast / Granular

Make sure to enter an application rate above

Do not use this input	
Do not use this input	
Do not use this input	
Do not use this input	
Do not use this input	
% incorporated	0.00%

Broadcast applications
Granular

Intermediate Calculations

mg ai/ft2:	2.27

LD50 ft-2

	wgt class (grams)	
Avian	20	5.55
	100	0.98
	1000	0.08
Mammal	15	4.91
	35	2.60
	1000	0.21

T-HERPS (turf use; CTS refinement)

T-HERPS MODEL INPUTS

These values will be used in the calculation of exposure estimates for foliar applications of pesticides.

Chemical Name:	**Methomyl**
Use:	**Grasses**
Product name and form:	
% A.I. (leading zero must be entered for formulations <1% a.i.):	**100.00%**
Application Rate (lbs/A):	**0.9**
Half-life (days):	**2.5**
Application Interval (days):	**5**
Number of Applications:	**4**
What taxonomic group are you assessing?	**Amphibian**
Does the assessed animal eat mammals?	**Yes**
Does the assessed animal eat amphibians or reptiles?	**Yes**

T-HERPS (version 1.1) is currently
assessing the California Red Legge
Garter Snake, the California Whip S
herptiles with dietary behaviors that
species. For example, T-HERPS d
herbivores. Future versions of T-HI
of an expanded set of herptiles.

See comment in this cell for information on enabling macros

Questions? Comments? Click here

Do you know the maximum size mammal that can be consumed by the assessed species? If so, choose "yes" in cell B16 and enter the corresponding sizes in the cells that appear. Note that data for 3 size classes can be entered. If you do not have data for specific size classes, then use professional judgement regarding whether the data allow for an estimate of the maximum size animal that can be consumed.	**No**
Do you know the maximum size amphibian or reptiles that can be consumed by the assessed species? If so, choose "yes" in cell B18 and enter the corresponding sizes in the cells that appear. Note that data for 3 size classes can be entered. If you do not have data for specific size classes, then use professional judgement regarding whether the data allow for an estimate of the maximum size animal that can be consumed.	**No**

Note: Sources of wildlife diet are assumed to be available for less than one year for this model.

Toxicity Data Inputs

Avian/Terrestrial Phase Amphibian - Enter **oral exposure terrestrial phase amphibian toxicity data** if available. Otherwise, enter avian toxicity data as you would for T-REX version 1.3.1.

		Indicate test species below	Optional Test Organism Body weight (g)	Optional Test Species Name
LD50 (mg/kg-bw)	24.20	Bobwhite quail		
LC50 (mg/kg-diet)	1100.00	Bobwhite quail		
NOAEL (mg/kg-bw)		Bobwhite quail		
NOAEC (mg/kg-diet)	150.00			
Enter the Mineau et al. Scaling Factor		1.0778		

Assessed Species Inputs

What is the body weight range of the assessed herptile (choose up to 3)?
Defaults are 2 grams, 20 grams, and 200 grams for amphibians and 2 grams, 20 grams, and 800 grams.

Small	**2**	grams
Medium	**20**	grams
Large	**200**	grams

What is the water content (percent as a whole number) of the assessed **small** herptile's diet	**80%**	Enter percent in whole numbers; in the absence of data indicating otherwise, assume 80% to be consistent with T-REX. Consult U.S. EPA (1993) for appropriate alternatives if specific diet is known. If there is a difference in dietary content of different sizes of the assessed species, enter different values for each size class and provide justification. For example, small individuals may consume mainly invertebrates, while larger adults may consume vertebrates.
What is the water content (percent as a whole number) of the assessed **medium** herptile's diet	**80%**	
What is the water content (percent as a whole number) of the assessed **large** herptile's diet	**80%**	

	Small Animal	**Medium**	**Large**
What is the maximum size **mammal** that can be consumed by the assessed species? NOTE: check the literature for appropriate value to use for the assessed species and enter into Row 16 if available. Default is that amphibians can eat an animal that is 2/3 of its body weight (based on observations of the CRLF, Cook, 1997). Maximum size prey for reptiles is calculated using the following equation: BW of assessed species ^1.071 (King, 2002).	**1.33**	**13.33**	**133.33**
What is the maximum size **amphibian/reptile** that can be consumed by the assessed species? NOTE: check the literature for appropriate value to use for the assessed species and enter into Row 16 if available. Default is that amphibians can eat an animal that is 2/3 of its body weight (based on observations of the CRLF, Cook, 1997). Maximum size prey for reptiles is calculated using the following equation: BW of assessed species ^1.071 (King, 2002).	**1.33**	**13.33**	**133.33**

Summary of EECs and RQs Based on Upper Bound Kenaga EECs

Table X. Upper Bound Kenaga, Acute Terrestrial Herpetofauna Dose-Based Risk Quotients

Size Class (grams)	Adjusted LD50	EECs and RQs									
		Broadleaf Plants/ Small Insects		Fruits/Pods/ Seeds/ Large Insects		Herbivore Mammals		Insectivore Mammal		Amphibians	
		EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
2.0	17.07	8.96	0.53	1.00	0.06	523.83	30.69	32.74	1.92	6.55	0.38
20	20.42	5.31	0.26	0.59	0.03	191.95	9.40	12.00	0.59	3.88	0.19
200	24.42	3.15	0.13	0.35	0.01	70.34	2.88	4.40	0.18	2.30	0.09

Table X. Upper Bound Kenaga, Subacute Terrestrial Herpetofauna Dietary Based Risk Quotients

LC50 (ppm)	EECs and RQs									
	Broadleaf Plants/ Small Insects		Fruits/Pods/ Seeds/ Large Insects		Herbivore Mammals		Insectivore Mammals		Amphibians	
	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
1100	161.37	0.15	17.93	0.02	287.93	0.26	18.00	0.02	5.83	0.01

Size class not used for dietary risk quotients

Table X. Upper Bound Kenaga, Chronic Terrestrial Herpetofauna Dietary Based Risk Quotients

NOAEC (ppm)	EECs and RQs									
	Broadleaf Plants/ Small Insects		Fruits/Pods/ Seeds/ Large Insects		Herbivore Mammals		Insectivore Mammals		Amphibians	
	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
150	161.37	1.08	17.93	0.12	287.93	1.92	18.00	0.12	5.83	0.04

Size class not used for dietary risk quotients

T-HERPS (turf use; SFGS refinement)

T-HERPS MODEL INPUTS

These values will be used in the calculation of exposure estimates for foliar applications of pesticides.

Chemical Name:	**Methomyl**
Use:	**Grasses**
Product name and form:	
% A.I. (leading zero must be entered for formulations <1% a.i.):	**100.00%**
Application Rate (lbs/A):	**0.9**
Half-life (days):	**2.5**
Application Interval (days):	**5**
Number of Applications:	**4**
What taxonomic group are you assessing?	**Reptile**
Does the assessed animal eat mammals?	**Yes**
Does the assessed animal eat amphibians or reptiles?	**Yes**

See comment in this cell for information on enabling macros

Questions? Comments? Click here

T-HERPS (version 1.1) is currently
assessing the California Red Legge
Garter Snake, the California Whip S
herptiles with dietary behaviors that
species. For example, T-HERPS d
herbivores. Future versions of T-HI
of an expanded set of herptiles.

Do you know the maximum size mammal that can be consumed by the assessed species? If so, choose "yes" in cell B16 and enter the corresponding sizes in the cells that appear. Note that data for 3 size classes can be entered. If you do not have data for specific size classes, then use professional judgement regarding whether the data allow for an estimate of the maximum size animal that can be consumed.	**No**
Do you know the maximum size amphibian or reptiles that can be consumed by the assessed species? If so, choose "yes" in cell B18 and enter the corresponding sizes in the cells that appear. Note that data for 3 size classes can be entered. If you do not have data for specific size classes, then use professional judgement regarding whether the data allow for an estimate of the maximum size animal that can be consumed.	**No**

Note: Sources of wildlife diet are assumed to be available for less than one year for this model.

Toxicity Data Inputs

Avian/Terrestrial Phase Amphibian - Enter **oral exposure terrestrial phase amphibian toxicity data** if available. Otherwise, enter avian toxicity data as you would for T-REX version 1.3.1.

		Indicate test species below	Optional Test Organism Body weight (g)	Optional Test Species Name
LD50 (mg/kg-bw)	24.20	Bobwhite quail		
LC50 (mg/kg-diet)	1100.00	Bobwhite quail		
NOAEL (mg/kg-bw)		Bobwhite quail		
NOAEC (mg/kg-diet)	150.00			
Enter the Mineau et al. Scaling Factor		1.0778		

Assessed Species Inputs

What is the body weight range of the assessed herptile (choose up to 3)?
Defaults are 2 grams, 20 grams, and 200 grams for amphibians and 2 grams, 20 grams, and 800 grams.

Small	2	grams
Medium	20	grams
Large	800	grams

What is the water content (percent as a whole number) of the assessed **small** herptile's diet	**80%**	Enter percent in whole numbers; in the absence of data indicating otherwise, assume 80% to be consistent with T-REX. Consult U.S. EPA (1993) for appropriate alternatives if specific diet is known. If there is a difference in dietary content of different sizes of the assessed species, enter different values for each size class and provide justification. For example, small individuals may consume mainly invertebrates, while larger adults may consume vertebrates.
What is the water content (percent as a whole number) of the assessed **medium** herptile's diet	**80%**	
What is the water content (percent as a whole number) of the assessed **large** herptile's diet	**80%**	

	Small Animal	**Medium**	**Large**
What is the maximum size **mammal** that can be consumed by the assessed species? NOTE: check the literature for appropriate value to use for the assessed species and enter into Row 16 if available. Default is that amphibians can eat an animal that is 2/3 of its body weight (based on observations of the CRLF, Cook, 1997). Maximum size prey for reptiles is calculated using the following equation: BW of assessed species ^1.071 (King, 2002).	**2.10**	**24.74**	**1285.91**
What is the maximum size **amphibian/reptile** that can be consumed by the assessed species? NOTE: check the literature for appropriate value to use for the assessed species and enter into Row 16 if available. Default is that amphibians can eat an animal that is 2/3 of its body weight (based on observations of the CRLF, Cook, 1997). Maximum size prey for reptiles is calculated using the following equation: BW of assessed species ^1.071 (King, 2002).	**2.10**	**24.74**	**1285.91**

Summary of EECs and RQs Based on Upper Bound Kenaga EECs

Table X. Upper Bound Kenaga, Acute Terrestrial Herpetofauna Dose-Based Risk Quotients

Size Class (grams)	Adjusted LD50	EECs and RQs									
		Broadleaf Plants/ Small Insects		Fruits/Pods/ Seeds/ Large Insects		Herbivore Mammals		Insectivore Mammal		Amphibians	
		EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
2.0	17.07	8.96	0.53	1.00	0.06	676.95	39.66	42.31	2.48	9.31	0.55
20	20.42	5.31	0.26	0.59	0.03	272.02	13.32	17.00	0.83	6.26	0.31
800	27.20	2.30	0.08	0.26	0.01	63.13	2.32	3.95	0.15	3.32	0.12

Table X. Upper Bound Kenaga, Subacute Terrestrial Herpetofauna Dietary Based Risk Quotients

LC50 (ppm)	EECs and RQs									
	Broadleaf Plants/ Small Insects		Fruits/Pods/ Seeds/ Large Insects		Herbivore Mammals		Insectivore Mammals		Amphibians	
	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
1100	161.37	0.15	17.93	0.02	219.90	0.20	13.74	0.01	5.06	0.00

Size class not used for dietary risk quotients

Table X. Upper Bound Kenaga, Chronic Terrestrial Herpetofauna Dietary Based Risk Quotients

NOAEC (ppm)	EECs and RQs									
	Broadleaf Plants/ Small Insects		Fruits/Pods/ Seeds/ Large Insects		Herbivore Mammals		Insectivore Mammals		Amphibians	
	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ	EEC	RQ
150	161.37	1.08	17.93	0.12	219.90	1.47	13.74	0.09	5.06	0.03

Size class not used for dietary risk quotients